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BLACK BRANT FROM ALASKA STAGING AND WINTERING IN JAPAN[1]

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Black Brant (*Branta bernicla nigricans*) nest in colonies in arctic Canada, Alaska, and Russia (Derksen and Ward 1993, Sedinger et al. 1993). Virtually the entire population stages in fall at Izembek Lagoon near the tip of the Alaska Peninsula (Bellrose 1976) before southward migration (Dau 1992) to winter habitats in British Columbia, Washington, Oregon, California, and Baja California (Subcommittee on Black Brant 1992). A small number of Black Brant winter in Japan, Korea, and China (Owen 1980). In Japan, 3,000–5,000 brant of unknown origin stop over in fall, and a declining population (< 1,000) of birds winter here, primarily in the northern islands (Brazil 1991, Miyabayashi et al. 1994). Here, we report sightings of brant in Japan that were marked in Alaska and propose a migration route based on historical and recent observations and weather patterns.

METHODS

Between 1986 and 1994 we captured flightless brant in drive traps at colonies and molting areas in Alaska on the Yukon-Kuskokwim (Y-K) and Colville River deltas and at the Teshekpuk Lake area and Prudhoe Bay; in Canada on the Anderson River Delta, and on Banks, Prince Patrick, Victoria and Melville Islands; and in Russia on the Anadyr River Delta and Wrangel Island (Fig. 1). Birds were aged by plumage characteristics and sexed by cloacal examination (Bent 1925: 243, Hanson 1967).

On each bird we attached a three-character, alphanumeric coded plastic band (27 mm tall) to one tarsus and a standard U.S. Fish and Wildlife Service metal band to the other leg. Plastic bands were color-coded for geographic areas: yellow, white, and orange for the Y-K Delta, green for the Colville River Delta and Teshekpuk Lake area, aqua for Prudhoe Bay, blue for Canada, and red for Russia.

We used telescopes (up to 130×) to read codes on tarsal-banded brant at the major fall and spring staging and wintering areas in North America, 1989–1994 and Japan, 1991–1995. Plastic tarsal bands, but not metal bands, could be read at distances to 250 m. Band code and color, age of bird, number of birds in the flock with marked birds, and behavior of marked brant were recorded on field forms and later entered in a computer data base.

We obtained upper wind data for October and November 1990–1994 from Environment Canada to help us determine possible migration corridors of brant departing from Alaska in the fall. In Canada, 6-hour synoptic vertical and horizontal upper wind data were plotted on a map and objectively interpolated to a global grid by personnel at the Canadian Meteorological Centre. This information was then used in program Trajectory (Environment Canada, unpubl. data) to estimate the 24-hour movement of a hypothetical floating balloon released at Izembek Lagoon, Alaska and at various pressure gradients. We then used program TrajPlot (Environment Canada and J. D. MacNeil, unpubl. data) to graph the daily position of the balloons over a 5-day period.

RESULTS AND DISCUSSION

Nearly 35,000 Black Brant were marked with plastic and metal bands since 1986. Nine of these birds with plastic bands were observed on Hokkaido and Honshu islands, Japan between 1991 and 1995. Four birds with unique bands were seen a total of 18 times and three other bands were observed once each but the codes were not read (Table 1). A bird with code KV6 was seen but the color was not determined.

Brant whose band color and code were read in Japan were marked at the Tutakoke River colony on the Y-K Delta ($n = 3$) and at Pt. McIntyre near Prudhoe Bay ($n = 1$). Three of the birds (two females and one male) were aged as hatching-year (HY) and one as an after-hatching-year (AHY) female at the time of their capture (Table 1). All three HY birds were resighted in Japan

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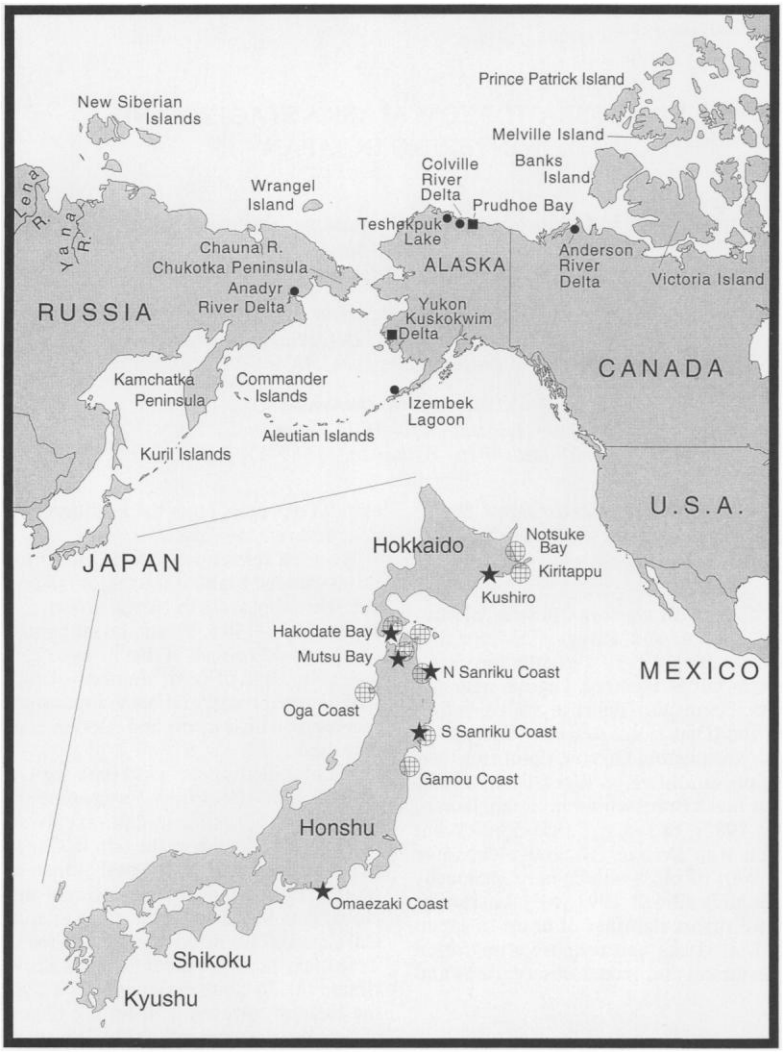

FIGURE 1. Locations where Black Brant were banded (shaded circles). Staging and wintering habitats (hatched areas) in Japan; stars show resighting locations (Table 1) of brant marked in Alaska (squares).

during the winter of their first year, and one of these (G2T) returned to Japan the subsequent winter as a one-year-old. The other bird, marked as an AHY female, was resighted at Hakodate Bay, Japan, for the first time the second winter (1993–1994) following banding; she staged at Izembek Lagoon in fall 1992 and wintered in Mexico in 1992–1993. One bird (G2T) was seen on the South Sanriku coast on Honshu in two successive winters.

Marked brant were resighted in Japan as early as 5 November and as late as 15 March. They were observed alone or in small flocks (range: 3–58 birds) in coastal bays (Fig. 1) where Black Brant have traditionally staged and wintered.

The origin of brant wintering in Japan, Korea, and China, although not documented with band returns, has been assumed to be nesting grounds along the East Siberian Sea coast between the rivers Yana and Chauna (Fig. 1, Uspenski 1960, Owen 1980). Dement'ev and Gladkov (1967) give the nesting range of this wintering population as occurring from the delta of the Lena River to the upper basin of the Anadyr River and Chukotka Peninsula; also on New Siberian, De Long, and Wrangel islands. Ward et al. (1993) showed that Wrangel Island brant, which are primarily molt migrants from Alaska and perhaps eastern Russian colonies, staged at Izembek Lagoon in fall and wintered in Baja California. Numerous individuals that molted on Wrangel Island and were marked with a red tarsus band have been observed breeding on the Y-K Delta

TABLE 1. Histories of Black Brant sighted in Japan that were marked in Alaska.

Band code	Japan				Alaska				
	No. of times seen	Resighted			Banded				
		Date(s)	Location	Coordinates	Date	Location	Coordinates	Age	Sex
Z7V	1	12 Jan 91	Omaezaki Coast	34°30′N 138°10′E	14 Jul 90	Tutakoke	61°17′N 165°35′W	Local	Female
G2T	6	2 Feb 93 through 15 Mar 93	South Sanriku Coast	38°49′N 141°34′E	23 Jul 92	Tutakoke	61°18′N 165°31′W	Local	Female
G2T	4	3 Jan 94 through 14 Jan 94	South Sanriku Coast	38°49′N 141°34′E					
G2T	1	11 Feb 94	North Sanriku Coast	40°30′N 141°40′E					
GHA	2	2 Jan 94 13 Jan 94	Hakodate Bay	41°40′N 141°30′E	2 Aug 92	Prudhoe Bay	70°23′N 148°35′W	AHY[1]	Female
VKO	4	18 Jan 95 through 10 Feb 95	South Sanriku Coast	38°49′N 141°34′E	19 Jul 94	Tutakoke	61°18′N 165°36′W	Local	Male

[1] AHY: After-Hatching-Year.

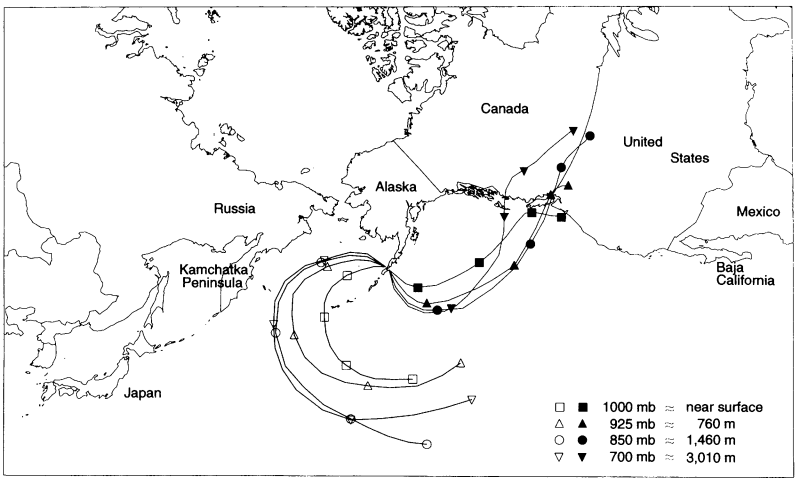

FIGURE 2. The tracks of weather balloons deployed from Cold Bay, Alaska (16 km south of Izembek Lagoon) on 6 November 1991 (open symbols) and 10 November 1991 (shaded symbols) are shown at daily intervals for four pressure level gradients. In 1991, the major departure of brant from Izembek Lagoon to Mexico occurred on 10 November.

(J. S. Sedinger, unpubl. data), establishing a link between these molting and breeding areas. We have had no recoveries or resightings in Japan of brant marked on Wrangel Island or at the Anadyr River.

These are the first records of brant from North American colonies staging and wintering in Japan. Although only one of the four marked birds was resighted at Izembek Lagoon in autumn, we believe that the other three, all of which were HY birds from the Tutakoke River colony, also made landfall at this key estuary. Izembek Lagoon serves as an important fall staging area for brant nesting on the Y-K Delta (Reed et al. 1989, Ward unpubl. data).

Brant forage on eelgrass (*Zostera marina*) for 29 to 68 days before most birds depart Izembek Lagoon (Reed et al. 1989). Low pressure systems that produce northwesterly winds across the Gulf of Alaska trigger their departure for wintering areas in Mexico, usually by mid-November (Fig. 2, Dau 1992). A small number (4,300 to 13,200 between 1985 and 1994) of this staging population remain at Izembek Lagoon and adjacent estuaries and bays through the winter months (C.P. Dau, pers. comm.).

Hansen and Nelson (1957) indicated a minor autumn migration corridor for brant from Izembek Lagoon west through the Aleutian Islands, but there were no sightings available then to document this route. More recently, investigators have recorded small numbers of brant along the Aleutian Chain in fall and winter months (D. Gibson, B. Kessel and J. Williams, unpubl. data; Byrd et al. 1974, Byrd and Day 1986).

In the Commander Islands, brant were seen in autumn (Stejneger 1885, Johansen 1961) and early winter (Stejneger 1887). A migration corridor along the east coast of the Kamchatka Peninsula (E. Lobkov, pers. comm.) is used by up to 6,000 brant in fall (N. Gerasimov, unpubl. data) and evidently fewer in spring (E. Lobkov, pers. comm.). The Kuril Islands are little brant have been reported (Gizenko 1955) in this group, which is an important migration corridor for other waterfowl (Kistchinski 1973).

The shortest distance between Izembek Lagoon and Hokkaido Island is 3,850 km, about 560 km less than the minimum migration distance between Izembek and winter habitats in Mexico (Dau 1992). Cyclonic weather systems that originate in Asia and generate winds that aid southeastward migration of brant also produce winds favorable for a westward migration from Izembek Lagoon as they track across the North Pacific (Brower et al. 1988). The peak concentration of brant in eastern Hokkaido occurs in late October to early November (Miyabayashi et al. 1994). Based on weather data from the North Pacific during October and November, 1990–1994, there were at least 3 days (median = 5, range: 3–15 days) each year that produced tailwinds favorable for brant migration to the west (Fig. 2).

A transoceanic flight route to Japan is reasonable because this behavior is consistent with autumn migration of brant to Mexico (Dau 1992). Satellite transmitters (Petersen 1995) may offer new opportunities to further define migration corridors of brant and other birds that spend most of their lives in marine habitats.

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